# CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

**NABL** - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377


Job No.: CTCE/BBMP/AM/W.No.07/CSR-06/679c/CEMENT/2018-19 Date: 25.06.2018

## TEST REPORT ON CEMENT

| | | |
|---|---|---|
| *** Customer** | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| *** Agency** | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| *** Name of Work** | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| *** Reference** | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| *** Sample ID** | : | Cement – Sample 1 |
| **Sample Received on** | : | 23.06.2018 |
| **Period of Testing** | : | 23.06.2018 to 25.06.2018 |

The results of the tests conducted on the cement sample are as follows:

| Sl. No | Descriptions | Test Method as per IS | Test Result | Requirements as per IS: 8112-2013 |
|---|---|---|---|---|
| 1 | Standard Consistency | IS-4031 (Part -4) 1988 (RA-2014) | 29.00 % | - |
| 2 | a) Initial Setting Time | IS-4031 (Part -5) 1988 (RA-2014) | 160 Minutes | Not Less than 30 Minutes |
| | b) Final Setting Time | IS-4031 (Part -5) 1988 (RA-2014) | 470 Minutes | Not More than 600 Minutes |
| 3 | Soundness by Le Chartlier Method | IS-4031 (Part-3) 1988 (RA-2014) | 1 mm | Not more than 10mm |

*Information is furnished by the Customer/Representative.

**Note:**

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⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory.

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

*********

VIDYARANI P.K.
Technical Manager


#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagara, Bangalore-79.
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Building & Highway Material Testing Laboratory

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T-2377


Job No.: CTCE/BBMP/AM/W.No.22/CSR-06/679c/SAND/2018-19 25.06.2018

## TEST REPORT ON SIEVE ANALYSIS OF FINE AGGREGATES

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of Work | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| * Sample ID | : | Fine Aggregates - Sample 1 |
| Technical Reference | : | IS : 2386 (Part 1) - 1963 (RA-2011) |
| Sample Received On | : | 23.06.2018 |
| Date of Testing | : | 25.06.2018 |

Total Wt. of Aggregates in gms = **1000**

| IS Sieve Size in mm | Cumulative Weight Passing in % | Specific Limits as per IS 383-1970 (RA- 2011) | | | |
|---|---|---|---|---|---|
| | | Zone-I | Zone-II | Zone-III | Zone-IV |
| 10 | 100 | 100 | 100 | 100 | 100 |
| 4.75 | 94.20 | 90-100 | 90-100 | 90-100 | 95-100 |
| 2.36 | 76.20 | 60-95 | 75-100 | 85-100 | 95-100 |
| 1.18 | 55.20 | 30-70 | 55-90 | 75-100 | 90-100 |
| 600 Micron | 27.20 | 15-34 | 35-59 | 60-79 | 80-100 |
| 300 Micron | 11.20 | 5-20 | 8-30 | 12-40 | 15-50 |
| 150 Micron | 6.20 | 0-10 | 0-10 | 0-10 | 0-15 |

* Information is furnished by the Customer/Representative

**Remarks :** This sample is under Zone-I specific limits.

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VIDYARANI P.K.
Technical Manager

Asst.E.E.N.D
AE(W7)

**********


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Job No.:CTCE/BBMP/AM/W.No.22/CSR-06/679c/AGG/GR/2018-19 25.06.2018

## TEST REPORT ON SIEVE ANALYSIS OF COARSE AGGREGATES

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of Work | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| * Sample ID | : | Coarse Aggregates (40mm) – Sample 1 |
| Technical Reference | : | IS : 2386 (Part 1) -1963 (RA-2011) |
| Sample Received on | : | 23.06.2018 |
| Date of Testing | : | 25.06.2018 |

Total Wt. of Aggregates in gms= **5000**

| IS Sieve Size in mm | Cumulative Weight Passing in % | Specific Limits as per IS 383-1970 (RA- 2011) | |
|---|---|---|---|
| | | Graded | Single Sized |
| 80 | 100 | 100 | - |
| 63 | 100 | - | 100 |
| 40 | 97.00 | 95-100 | 85-100 |
| 20 | 32.90 | 30-70 | 0-20 |
| 10 | 11.50 | 10-35 | 0-5 |
| 4.75 | 2.30 | 0-5 | - |

* Information is furnished by the Customer/Representative

**Remarks :** This sample is under graded specific limits.

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JAS-ANZ BSCIC ISO 9001 REGISTERED


Job No.:CTCE/BBMP/AM/W.No.07/Steel/2018-19 25.06.2018

## TEST REPORT ON REINFORCEMENT STEEL

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of work | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| * Samples ID | : | 10 mm Bar |
| Technical Reference | : | IS: 1786-2008 (RA-2013) |
| Date of Testing | : | 25.06.2018 |

| Sl No | Nominal size (dia) (mm) | Mass per metre (Kg/mtr) | TENSILE STRENGTH | | | Bend Test | Rebend Test |
|---|---|---|---|---|---|---|---|
| | | | 0.20% proof stress/Yield stress N/mm2 | Tensile strength (Ultimate stress) N/mm2 | Elongation percent gauge length | | |
| 1 | 10 | 0.62 | 521 | 563 | 13.35 | O.K | O.K |

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T-2377


Job No.:CTCE/BBMP/AM/W.No.07/CSR-06/679c/Cube/2018-19 03.08.2018

## TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of the work | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| * Sample ID | : | Cement Concrete |
| Technical Reference | : | IS: 516-1959 (RA-2013) |
| Size of cubes | : | 150mmx150mmx150mm |
| Cross Sectional Area | : | 22500 $mm^2$ |
| * Grade of Concrete | : | $M_{20}$ |
| Compressive Strength as on | : | $28^{th}$ day |
| Sample Received on | : | 03.08.2018 |

| Sl.No. | * Date of casting | Date of testing | Weight of cube (Kg) | Failure load (KN) | Compressive strength ($N/mm^2$) |
|---|---|---|---|---|---|
| 1 | 06.07.2018 | 03.08.2018 | 8.102 | 485.9 | 21.60 |
| 2 | 06.07.2018 | 03.08.2018 | 8.208 | 511.6 | 22.74 |
| 3 | 06.07.2018 | 03.08.2018 | 8.350 | 520.3 | 23.12 |

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# CIVIL-TECH CONSULTANTS AND ENGINEERS

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JAS-ANZ BSCIC ISO 9001 REGISTERED


Job No.:CTCE/BBMP/AM/W.No.07/WMM/Gradation/2018-19 16.07.2018

## TEST REPORT ON GRADATION OF WET MIX MACADAM

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of Work | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| Sample ID | : | Wet Mix Macadam |
| Technical Reference | : | IS 2386 (part-1)1963 (RA-2011) |
| Date of Testing | : | 16.07.2018 |

Oven Dry Wt (gm): **5000**

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits As per Morth Table 400-13 |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0 | 100 | 100 |
| 45 | 130 | 130 | 2.6 | 97.4 | 95-100 |
| 22.4 | 1585 | 1715 | 34.30 | 65.70 | 60-80 |
| 11.2 | 1055 | 2770 | 55.40 | 44.60 | 40-60 |
| 4.75 | 665 | 3435 | 68.70 | 31.30 | 25-40 |
| 2.36 | 430 | 3865 | 77.30 | 22.70 | 15-30 |
| 0.600 | 385 | 4250 | 85.00 | 15.00 | 8-22 |
| 0.075 | 510 | 4760 | 95.20 | 4.80 | 0-8 |

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/AM/W.No.07/WMM/AIV/2018-19

16.07.2018

## TEST REPORT ON IMPACT VALUE OF AGGREGATE

| | | |
|---|---|---|
| *** Customer** | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| *** Agency** | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| *** Name of Work** | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| *** Reference** | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| *** Sample ID** | : | Wet Mix Macadam |
| **Technical Reference** | : | IS : 2386( Part -4)-1963 (RA-2011) |
| **Date of Testing** | : | 16.07.2018 |

| Sl No. | Details | Trial No. | | Average |
|---|---|---|---|---|
| | | 1 | 2 | |
| 1 | Total weight of aggregate sample filling the cylindrical measure = $W_1$ g | 391 | 392 | |
| 2 | Weight of agregate passing 2.36 mm sieve after the test = $W_2$ g | 91 | 93 | |
| 3 | Weight of aggregate retained 2.36 mm sieve after the test = $W_3$ g | 300 | 299 | |
| 4 | Aggregate Impact value = percent fines 100* (W2/W1)% | 23.27 | 23.72 | **23.50** |

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/AM/W.No.07/WMM/Shape.T/2018-19 16.07.2018

## TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

| | | |
|---|---|---|
| *** Customer** | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| *** Agency** | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| *** Name of Work** | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| *** Reference** | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| *** Sample ID** | : | Wet Mix Macadam |
| **Technical Reference** | : | IS 2386(Part 1) 1963 (RA 2011) |
| **Date of Testing** | : | 16.07.2018 |

| Sl.No. | Description | Result |
|---|---|---|
| 1 | Flakiness Index | 11.33% |
| 2 | Elongation Index | 12.26% |
| 3 | Combined Flakiness & Elongation Index | 23.59% |

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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AE(WZ)

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JAS-ANZ BSCIC ISO 9001 REGISTERED


Job No.: CTCE/BBMP/AM/W.No.07/WMM/Gradation/2018-19 23.07.2018

## TEST REPORT ON GRADATION OF WET MIX MACADAM

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of Work | | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| Sample ID | : | Wet Mix Macadam |
| Technical Reference | : | IS 2386 (part-1)1963 (RA-2011) |
| Date of Testing | : | 23.07.2018 |

Oven Dry Wt (gm): **5000**

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits As per Morth Table 400-13 |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0 | 100 | 100 |
| 45 | 135 | 135 | 2.7 | 97.3 | 95-100 |
| 22.4 | 1580 | 1715 | 34.30 | 65.70 | 60-80 |
| 11.2 | 1055 | 2770 | 55.40 | 44.60 | 40-60 |
| 4.75 | 665 | 3435 | 68.70 | 31.30 | 25-40 |
| 2.36 | 440 | 3875 | 77.50 | 22.50 | 15-30 |
| 0.600 | 380 | 4255 | 85.10 | 14.90 | 8-22 |
| 0.075 | 590 | 4845 | 96.90 | 3.10 | 0-8 |

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Job No.: CTCE/BBMP/AM/W.No.07/WMM/Gradation/2018-19 01.08.2018

## TEST REPORT ON GRADATION OF WET MIX MACADAM

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
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| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| Sample ID | : | Wet Mix Macadam |
| Technical Reference | : | IS 2386 (part-1)1963 (RA-2011) |
| Date of Testing | : | 01.08.2018 |

Oven Dry Wt (gm): **5000**

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits As per Morth Table 400-13 |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0 | 100 | 100 |
| 45 | 136 | 136 | 2.7 | 97.3 | 95-100 |
| 22.4 | 1560 | 1696 | 33.92 | 66.08 | 60-80 |
| 11.2 | 1056 | 2752 | 55.04 | 44.96 | 40-60 |
| 4.75 | 664 | 3416 | 68.32 | 31.68 | 25-40 |
| 2.36 | 445 | 3861 | 77.22 | 22.78 | 15-30 |
| 0.600 | 385 | 4246 | 84.92 | 15.08 | 8-22 |
| 0.075 | 600 | 4846 | 96.92 | 3.08 | 0-8 |

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Job No.:CTCE/BBMP/AM/W.No.07/WMM/Gradation/2017-18 06.08.2018

## TEST REPORT ON GRADATION OF WET MIX MACADAM

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of Work | | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| Sample ID | : | Wet Mix Macadam |
| Technical Reference | : | IS 2386 (part-1)1963 (RA-2011) |
| Date of Testing | : | 06.08.2018 |

Oven Dry Wt (gm): **5000**

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits As per Morth Table 400-13 |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0 | 100 | 100 |
| 45 | 132 | 132 | 2.6 | 97.4 | 95-100 |
| 22.4 | 1580 | 1712 | 34.24 | 65.76 | 60-80 |
| 11.2 | 1050 | 2762 | 55.24 | 44.76 | 40-60 |
| 4.75 | 660 | 3422 | 68.44 | 31.56 | 25-40 |
| 2.36 | 432 | 3854 | 77.08 | 22.92 | 15-30 |
| 0.600 | 386 | 4240 | 84.80 | 15.20 | 8-22 |
| 0.075 | 508 | 4748 | 94.96 | 5.04 | 0-8 |

*Information is furnished by the Customer/Representative.

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# CIVIL-TECH CONSULTANTS AND ENGINEERS

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**NABL** - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED


Job No.: CTCE/BBMP/AM/W.No.07/WMM/Gradation/2018-19 10.08.2018

## TEST REPORT ON GRADATION OF WET MIX MACADAM

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of Work | | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| Sample ID | : | Wet Mix Macadam |
| Technical Reference | : | IS 2386 (part-1)1963 (RA-2011) |
| Date of Testing | : | 10.08.2018 |

Oven Dry Wt (gm): **5000**

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits As per Morth Table 400-13 |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0 | 100 | 100 |
| 45 | 130 | 130 | 2.6 | 97.4 | 95-100 |
| 22.4 | 1585 | 1715 | 34.30 | 65.70 | 60-80 |
| 11.2 | 1055 | 2770 | 55.40 | 44.60 | 40-60 |
| 4.75 | 665 | 3435 | 68.70 | 31.30 | 25-40 |
| 2.36 | 430 | 3865 | 77.30 | 22.70 | 15-30 |
| 0.600 | 385 | 4250 | 85.00 | 15.00 | 8-22 |
| 0.075 | 510 | 4760 | 95.20 | 4.80 | 0-8 |

*Information is furnished by the Customer/Representative.

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Authorised Signatory

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Job No: CTCE/BBMP/AM/W.No.07/BC/Bitumen/2018-19 20.08.2018

## BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

**As per IS2386 and IRC:SP:11-1984**

| | |
|---|---|
| * Customer | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of Work | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| * Sample ID | Road in Amruthahalli A Manjunath House road in S. C Colony in Ward |
| DATE OF TESTING | 20.08.2018 |

### BITUMEN CONTENT DETERMINATION

| Description | Sample 1 | Sample 2 |
|---|---|---|
| 1. Weight of Mixture before Test, g | 500 | 500 |
| 2. Weight of Mixture after Test, g | 479 | 465 |
| 3. Weight of Asphalt and Mineral matter Extracted, g | 21 | 35 |
| 4. Weight of Mineral Matter, g. | - | - |
| 5. Weight of Ash, g | - | - |
| 6. Weight of Bitumen Extracted, g. (corrected) | 21 | 35 |
| 7. Bitumen content in % | 4.20 | 7.00 |
| 8. Average | **5.60** | |

### GRADATION AFTER EXTRACTION

**TABLE - 1**

| SIEVE SIZE | Percent Passing, % | | JOBMIX |
|---|---|---|---|
| mm | Sample 1 | Sample 2 | Gradation |
| 19 | 100.00 | 100.00 | 100 |
| 13.2 | 86.56 | 88.65 | 79-100 |
| 9.5 | 85.35 | 82.35 | 70-88 |
| 4.75 | 65.25 | 63.25 | 53-71 |
| 2.36 | 43.35 | 46.52 | 42-58 |
| 1.18 | 45.25 | 40.25 | 34-48 |
| 0.6 | 28.25 | 29.30 | 26-38 |
| 0.3 | 23.23 | 25.25 | 18-28 |
| 0.15 | 17.25 | 18.32 | 12-20 |
| 0.075 | 6.10 | 7.25 | 4-10 |

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/AM/W.No.07/BC/AIV/2018-19 20.08.2018

## TEST REPORT ON IMPACT VALUE OF AGGREGATES

| | | |
|---|---|---|
| *** Customer** | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| *** Agency** | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| *** Name of Work** | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| *** Reference** | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| *** Sample ID** | : | Hot mix plant, Bangalore. |
| *** Type of Mix** | : | Bituminous Concrete |
| **Technical Reference** | : | IS: 2386 (Part- 4 )-1963 (RA-2011) |
| **Date of Testing** | : | 20.08.2018 |

| Sl No. | Details | Trial No. | | Average |
|---|---|---|---|---|
| | | 1 | 2 | |
| 1 | Total weight of aggregate sample filling the cylindrical measure = $W_1$ g | 392 | 393 | |
| 2 | Weight of agregate passing 2.36 mm sieve after the test = $W_2$ g | 89 | 90 | |
| 3 | Weight of aggregate retained 2.36 mm sieve after the test = $W_3$ g | 303 | 303 | |
| 4 | Aggregate Impact value = percent fines 100* (W2/W1) percent | 22.70 | 22.90 | **22.80** |

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/AM/W.No.07/BC/Shape.T/2018-19 20.08.2018

## TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

| | | |
|---|---|---|
| *** Customer** | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| *** Agency** | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| *** Name of Work** | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| *** Reference** | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| *** Sample ID** | : | Hot mix plant, Bangalore |
| **Technical Reference** | : | IS : 2386( Part -1)-1963 (RA-2011) |
| *** Type of Mix** | : | Bituminous Concrete |
| **Date of Testing** | : | 20.08.2018 |

| Sl.No. | Description | Result |
|---|---|---|
| 1 | Flakiness Index | 16.29% |
| 2 | Elongation Index | 10.51% |
| 3 | Combined Flakiness & Elongation Index | 26.80% |

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job N[redacted]CTCE/BBMP/AM/W.No.07/BC/Sp_Wa/2018-19 20.08.2018

## TEST REEPORT ON SPECIFIC GRAVITY AND WATER ABSORPTION

| | | |
|---|---|---|
| * Customer | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| * Agency | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| * Name of Work | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| * Reference | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| * Sample ID | : | Hot mix plant, Bangalore |
| Technical Reference | : | IS : 2386( Part -3)-1963 (RA-2011) |
| * Type of Mix | : | Bituminous Concrete |
| Date of Testing | : | 20.08.2018 |

| Sl. No. | Details | Notation | Test Number | | | Mean Value |
|---|---|---|---|---|---|---|
| | | | Test 1 | Test 2 | Test 3 | |
| 1 | Weight of aggregate suspended in water with the basket | $W_1$ g | 1999 | 2002 | 2000 | |
| 2 | Weight of basket suspended in water | $W_2$ g | 755 | 755 | 755 | |
| 3 | Weight of saturated aggregate in water | $(W_1 - W_2) = W_s$ g | 1239 | 1238 | 1245 | |
| 4 | Weight of saturated surface dry aggregate in air | $W_3$ g | 2025 | 2026 | 2024 | |
| 5 | Weight of water equal to the volume of the aggregate | $(W_3 - W_S)$ g | 786 | 788 | 779 | |
| 6 | Weight of oven dried aggregate | $W_4$ g | 2010 | 2011 | 2012 | |
| 7 | Specific Gravity | $W_4/(W_3-W_S)$ | 2.557 | 2.552 | 2.583 | 2.564 |
| 8 | Apparent Specific gravity | $W_4/(W_4-W_S)$ | 2.607 | 2.602 | 2.623 | 2.611 |
| 9 | Water Absorption | $((W_3-W_4)*100)/W_4$ | 0.75% | 0.75% | 0.60% | 0.70% |

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/AM/W.No.07/BC/Stripping/2018-19 20.08.2018

## TEST REPORT ON STRIPPING VALUEOF ROAD AGGREGATES (STATIC IMMERSION TEST)

| | | |
|---|---|---|
| *** Customer** | : | **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP Bangalore. |
| *** Agency** | : | **Mr. A. Manjunath,** #111, Pilakamma Temple Street, Amruthahalli Sahakarnagar post, Bangalore-92. |
| *** Name of Work** | : | Improvements of Roads and Drains in Amruthahalli A Manjunath House road in S. C Colony Amruthahalli in Ward No.07, Byatarayanapura, BBMP, Bangalore. |
| *** Reference** | : | BBMP/EE/BTP/WO/278/2015-16 Dated: 03.03.2016 |
| **Technical Reference** | : | IS: 6241 |
| *** Type of Mix** | : | Bituminous Concrete |
| **Date of Testing** | : | 20.08.2018 |

Type of binder : 60/70
Percentage of binder used : 5.00% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.00 g
Temperature of water-bath : 40° C

| Observation Number | Stripping, Percentage | Average, Percentage | Average Retained Coating, % |
|---|---|---|---|
| 1 | 3.1 | 3.20 | 96.80 |
| 2 | 3.2 | | |
| 3 | 3.3 | | |

*Information is furnished by the Customer/Representative.

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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